

1 Claim:

1. A method for removing heavy metal contaminants from wastewaters, comprising the steps of:

- 5 providing a wastewater including one or more heavy metal contaminants;
adjusting to the pH of the wastewater to a pH of about 7 or greater to precipitate oxides
and hydroxides of the heavy metals, and where soluble heavy metals remain in the wastewater;
introducing a polymeric metal removing agent to substantially precipitate the remaining
soluble heavy metals; and
10 removing the precipitates formed in the previous steps from the wastewater thereby
substantially removing the heavy metal contaminants.

2. The method of claim 1 wherein the pH of the wastewater is adjusted to a pH in the range of about 7 to 11.

- 15 3. The method of claim 1 wherein the polymeric metal removing agent is a
polymeric dithiocarbamate material.

- 20 4. The method of claim 3 wherein the polymeric dithiocarbamate material is selected
from the group of: Nalmet and MetClear 2405.

5. The method of claim 1 wherein the polymeric metal removing agent is introduced
at a concentration in the range of 2 to 300 ppm in the wastewater.

- 25 6. The method of claim 1 wherein the polymeric metal removing agent is introduced
at a concentration of about 20 ppm in the wastewater.

7. The method of claim 1 wherein the pH of the wastewater is maintained in the range of about 5 to 11 during introduction of the polymeric material.

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8. The method of claim 1 wherein the precipitate formed of the remaining soluble heavy metals have a particle diameter in the range of about 10 to 500 microns.

9. The method of claim 1 further comprising the step of: adding coagulants and/or flocculants to the wastewater.

10. A system for removing heavy metal contaminants from wastewaters, comprising:
a first reaction tank for receiving the wastewater and wherein the pH of the wastewater is adjusted to a pH of about 7 or greater;

10 a first mixer coupled to the first reaction tank for mixing the wastewater to assist precipitation of oxides and hydroxides of the heavy metals and wherein soluble metals remain in the wastewater;

15 a second reaction tank for receiving the wastewater from the first reaction tank;
injection means coupled to the second reaction tank for injecting a polymeric metal removal agent into the second reaction tank;

a second mixer coupled to the second reaction tank for mixing the wastewater to assist precipitation of the remaining soluble metals;

20 a filtration system for receiving the wastewater and precipitates from the second reaction tank, said filtration system including one or more filter vessels having one or more filter membranes arranged in a tubular sock configuration and placed over a slotted tube, and one or more settling tanks.

11. The system of claim 10 wherein said filtration system is capable of filtering the wastewater at a flow rate of up to 800 gallon/ft²/day.

25 12. The system of claim 10 wherein the filtration system is operated at a maximum pressure of about 10 psi.